UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/441,709	11/16/1999	STEWART GRESTY SMITH	99EDI3175260	4843

27975 7590 01/27/2005

ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST P.A.
1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE
P.O. BOX 3791
ORLANDO, FL 32802-3791

EXAMINER	
SELBY, GEVELL V	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/441,709	SMITH, STEWART GRESTY	
	Examiner	Art Unit	
	Gevell Selby	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *65-84* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *65-83* is/are rejected.

7)☒ Claim(s) *84* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/11/04 has been entered.

Response to Arguments

2. Applicant's arguments, see the amendment, filed 8/11/04, with respect to the rejection(s)of claim(s) 65-84 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ichikawa, US 5,917,957.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 65-75, 78, 79 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116.

In regard to claim 65, Ichikawa, US 5,917,957, discloses a method for processing a video data stream in an electronic imaging system comprising a memory (see column 5, lines 37-52), said video data stream comprising a series of pixel values corresponding to pixel sites in the electronic imaging system, the method comprising:

filtering the video data stream in real time for correcting/modifying defective pixel values (see column 3, line 65 to column 6, line 2), the filtering comprising filtering pixel values not stored the memory using a first filtering algorithm (see figure 2, element 4 and column 3, line 65 to column 6, line 2), identifying defective pixel values, storing locations of the defective pixel values the memory (see figure 2, element 5 and column 3, line 65 to column 6, line 2).

The Ichikawa reference does not disclose filtering the defective pixel values stored in the memory using a second filtering algorithm.

Longheed, US 4,541,116, discloses a method for removing noise from an image that uses the current pixel value as part of a data set used to determine how to correct/modify the current pixel value (see column 5, lines 35-47).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116 to have the filtering algorithm of Longheed as the second filtering algorithm to filter the defective pixel values stored in the memory, in order to achieve an image of higher quality.

In regard to claim 66, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, teaches the method according to Claim 65. Ichikawa teaches median filtering,

which reads on a step filtering that comprises filtering each pixel value based on a plurality of adjacent pixel values (see figure 2, element 4 and column 3, line 65 to column 6, line 2).

In regard to claim 67, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, teaches the method according to Claim 66. Longhead discloses that the filtering comprises filtering each pixel value using a current pixel value as part of a data set including the plurality of adjacent pixel values for determining whether to correct/modify the current pixel value and how to correct/modify the current pixel value (see column 5, lines 35-47).

In regard to claim 68, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 65. The Ichikawa reference discloses a median filtering operation, which reads on the filtering of each pixel value is based on a plurality of adjacent pixel values; the first filtering algorithm using a current pixel value as part of a data set including the plurality of adjacent pixel values (see figure 2, element 4 and column 3, line 65 to column 6, line 2).

In regard to claim 69, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 68. The Longheed reference wherein the first filtering algorithm implements the following:

sorting the current pixel value and the plurality of adjacent pixel values into a rank order based upon predetermined criteria (see column 2, lines 10-14);

and modifying the current pixel value with respect to its rank in the rank order (see column 2, lines 19-24).

In regard to claim 70, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 69. The Longheed reference discloses wherein the current pixel value modified if its rank is greater than a predetermined maximum rank value or less than a predetermined minimum rank value (see column 5, lines 38-47).

In regard to claim 71, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 70, further comprising:

replacing the current pixel value by a pixel value having the predetermined maximum rank value if the rank of the current pixel value is greater than the predetermined maximum rank value (see column 5, lines 37-41); and

leaving the current pixel value unchanged the current pixel value has a rank less than the predetermined maximum rank value and greater than the predetermined minimum rank value (see column 5, lines 37-41).

The Ichikawa and Longheed references do not disclose replacing the current pixel value by a pixel value having the predetermined minimum rank value if the rank of the current pixel value is less than the predetermined minimum rank value. The Longheed reference does teach that the means for selecting the filtering method is programmable (see column 2, lines 19-24). Official Notice is taken that it is well known in the art to use a minimum rank filtering method to replace replacing the current pixel value by a pixel value having the predetermined minimum rank value if the rank of the current pixel value

is less than the predetermined minimum rank value, in order to minimize the noise in the image.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify , Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, to have the filtering algorithm include the step of replacing the current pixel value by a pixel value having the predetermined minimum rank value if the rank of the current pixel value is less than the predetermined minimum rank value in order to improve the image quality.

In regard to claim 72, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 71. The Ichikawa reference discloses wherein the predetermined maximum rank value is a highest ranking of the plurality of adjacent pixel values, and the predetermined minimum rank value is a lowest ranking of the plurality of adjacent pixel values (see col. 5, lines 38-47 and official notice above).

In regard to claim 73, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according Claim 65. The Ichikawa reference discloses wherein storing locations of the defective pixel values is based upon an output of the first filtering algorithm (see column5, line 65 to column 6, line 2).

In regard to claim 74, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 73. The Ichikawa reference discloses that the determination of a defect is based upon the magnitude of the difference between the original and filtered images, which reads on a pixel value is determined to be

defective based on a magnitude of a difference between a current pixel value and a pixel value corresponding to the output of the first filtering algorithm (see column 6, lines 3-26).

In regard to claim 75, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 74. The Ichikawa and Longhead references do not disclose that the location of at least one pixel value having a greatest difference in magnitude from the output of the first filtering algorithm is stored in the memory for each frame of video data.

Official Notice is taken that it is well known in the art to store the maximum defective pixel value in memory. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to store the greatest defect in memory to assess the variation in error from frame to frame.

In regard to claim 78, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 65. The Ichikawa reference discloses that the storing comprises storing a defect value corresponding to a magnitude of the defect exhibited by each defective pixel value (see column 6, lines 22-28).

In regard to claim 79, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 78. The Ichikawa reference discloses further comprising updating contents of the memory using a predetermined memory management algorithm (se column 6, lines 22-28).

In regard to claim 81, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 65. The Ichikawa and Longheed

references do not disclose that the first and second filtering algorithms are applied to the video data stream in parallel, and a final output pixel value is selected from outputs of the first and second filtering algorithms depending on whether a corresponding pixel location is stored in the memory.

Official Notice is taken that it is well known in the art to multiplex different filtered signals to select desired data.

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, to have the first and second filtering algorithms are applied to the video data stream in parallel, and a final output pixel value is selected from outputs of the first and second filtering algorithms depending on whether a corresponding pixel location is stored in the memory, in order to save processing time..

5. Claims 76, 77, 82, and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, and Kaplan, US 4,977,521.

In regard to claim 76, Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, discloses a method according to Claim 65. Ichikawa teaches median filtering, which reads on a step filtering that comprises filtering each pixel value based on a plurality of adjacent pixel values (see figure 2, element 4 and column 3, line 65 to column 6, line 2). The Ichikawa and Longheed references do not disclose that the second filtering algorithm excludes a current pixel value from a data set including the plurality of adjacent pixel values.

Kaplan, US 4,677,521, discloses an algorithm that searches the neighborhood of a defective pixel for non-defective pixel values to use in correcting the defective pixel (see column 11, line 67 to column 12, line 8).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, and Kaplan, US 4,977,521, to have the second filtering algorithm excludes a current pixel value from a data set including the plurality of adjacent pixel values, in order to exclude defect noise from the correction calculation to obtain a better correction value for the defect.

In regard to claim 77, Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, and Kaplan, US 4,977,521, method according to Claim 76. Kaplan discloses s filtering algorithm that replaces the current pixel value with a median value of the plurality of adjacent pixel values (see column 12, lines 5-7).

In regard to claim 82, Ichikawa, US 5,917,957, discloses an apparatus for processing a video data stream comprising:

an electronic imaging device (see figure 2, element 1and column 5, lines 37-39);

a first filter circuit (see figure 2, element 4) connected to said electronic imaging device for filtering the video data stream in real time for correcting/ modifying defective pixel values, the video data stream comprising a series of pixel values corresponding to pixel sites in said electronic imaging device (see column 5, line 65 to column 6, line 2);

a sampling circuit (see figure 2, element 9) connected to said first filter circuit for sampling the video data stream to obtain a data set comprising a current pixel value and a plurality of adjacent pixel values (see column 6, lines 29-400).

The Ichikawa reference does not disclose a ranking circuit connected to said sampling circuit for sorting the plurality of adjacent pixel values into a rank order based upon predetermined criteria; a comparator connected to said ranking circuit for comparing a current pixel value with the plurality of adjacent pixel values of selected ranks, and for generating a first filter output based upon the comparison; and a median circuit connected to said ranking circuit for determining a median value of the plurality of adjacent pixel values and for generating a second filter output equal to the median value.

Longheed, US 4,541,116, discloses a ranking circuit (rank sorter 38) for sorting the plurality of adjacent pixel values into a rank order based upon predetermined criteria (col. 5, lines 5-9), and a comparator (output selector 36) connected to said ranking circuit for comparing a current pixel value with the plurality of adjacent pixel values of selected ranks, and for generating an output based upon the comparison (col. 5, lines18-22).

Kaplan, US 4,977,521, discloses a filtering algorithm that replaces the current pixel value with a median value of the plurality of adjacent pixel values (see column 12, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, and Kaplan, US 4,977,521, to have a ranking circuit connected to said sampling circuit for sorting the plurality of adjacent pixel values into a rank order

based upon predetermined criteria; a comparator connected to said ranking circuit for comparing a current pixel value with the plurality of adjacent pixel values of selected ranks, and for generating a first filter output based upon the comparison; and a median circuit connected to said ranking circuit for determining a median value of the plurality of adjacent pixel values and for generating a second filter output equal to the median value, in order to generate an image of higher quality.

In regard to claim 83, Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, and Kaplan, US 4,977,521, discloses an apparatus according to Claim 82. The Ichikawa reference further comprising a memory for storing pixel locations selected based upon the first filter output (figure 2, element 5 and column 5, line 65 to column 6, line 2: It is implied that the memory will be corrected to the comparator, in order the perform the second filtering on the defective pixels saved in the memory).

6. **Claim 80 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, in view of Kaplan, US 4,977,521, and further in view of Mahant-Shetti et al., 6,529,238.**

In regard to claim 80, Ichikawa, US 5,917,957 in view of Longhead, US 4,541,116, discloses the method according to Claim 79. The Ichikawa, Longhead, and Kaplan references do not disclose further comprising updating the defect value of each defective pixel value based upon an auto-regression function applied to a current pixel value of each defective pixel location stored in the memory, a current output from the second filtering algorithm and a current stored defect value.

Mahant-Shetti et al., 6,529,238, discloses the step of updating contents in memory that indicate the magnitude of defect for a pixel (see column 7, lines 47-62).

Official Notice is taken that it is well known in the art to use an auto-regression to update values, in order to determine if a pixel should still be considered defective.

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Ichikawa, US 5,917,957, in view of Longhead, US 4,541,116, in view of Kaplan, US 4,977,521, and further in view of Mahant-Shetti et al., 6,529,238, to have the step of updating the defect value of each defective pixel value based upon an auto-regression function applied to a current pixel value of each defective pixel location stored in the memory, a current output from the second filtering algorithm and a current stored defect value, in order to dynamically compensate for the defects in pixel signals.

Allowable Subject Matter

7. Claim 84 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 84 discloses the allowable subject matter noted in the previous Office Action, paper no. 12.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs

TUAN HO
PRIMARY EXAMINER